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LEAD EXPOSURE REDUCTION ACT OF 1990

OCTOBER 18 (legislative day, OCTOBER 2), 1990.—Ordered to be printed

Mr. BURDICK, from the Committee on Environment and Public Works, submitted the following

REPORT

together with

ADDITIONAL VIEWS

[To accompany S. 2637]

The Committee on Environment and Public Works, to which was referred the bill (S. 2637) to amend the Toxic Substances Control Act to reduce the levels of lead in the environment, and for other purposes, having considered the same, reports favorably thereon with an amendment and recommends that the bill (as amended) do pass.

GENERAL STATEMENT

S. 2637 restricts certain uses of lead; requires the Environmental Protection Agency to maintain an inventory of the uses of lead; establishes a mandatory recycling program for lead-acid batteries; and establishes several programs for research into lead abatement, monitoring and health effects from exposure to lead.

BACKGROUND

Introduction.—Lead is a metallic element whose properties (malleability, corrosion resistance, high density, stability, opacity to gamma and X-ray energy, low sound conductance, and special electrical properties) have led to a wide variety of usages dating back to ancient times. Ancient Egyptians used lead in ornaments and cosmetics. Ancient Romans used lead in water pipes, storage containers, and drinking goblets. The Romans also used it as a sweet-

ener and preservative in wines and ciders. In fact, the words plumber and plumbing are derived from the Latin word for lead, plumbum.

The dangers of lead usage were also known to ancient peoples. The Greek Dioscorides stated in the second century B.C. that "Lead makes the mind give way." The Roman Pliny the Elder cautioned that inhaling the fumes of molten lead was dangerous. The pervasive lead contamination of the Romans may, according to some historians, have lowered their birthrate and caused much of the documented madness that helped bring down this mighty empire.

Despite millenia of warnings about its hazards, lead usage in the United States continues at a high rate and in a wide variety of products. Products in which lead is currently used include: paint, gasoline, batteries, food, cosmetics, prescription drugs, cans (food and other), ceramic glazes, enamels, solder, packaging, toys and recreational game pieces, pesticides, fertilizers, plumbing fittings and fixtures, wine and beer bottles, stained glass, fishing weights, curtain weights, construction materials, television tubes, computer screens, ammunition, medical uses (e.g., x-ray and other medical imaging devices), nuclear powerplant shielding, nuclear waste disposal, aviation soundproofing, electronic circuitry, light bulbs, optical and ophthalmic glass, cable sheathing, and piezo electric ceramics.

According to industry data, about 1.23 million metric tons of lead were used in these and other products during 1989, of which 440,000 metric tons were non-recycled lead. The majority of this lead usage (955,000 metric tons or 77.7 percent) was in batteries (including industrial and specialty batteries). The next highest individual categories were chemicals (5 percent), ammunition (4.3 percent), and castings/sheet/extrusions (3.6 percent).

Lead usage in gasoline has declined dramatically since the 1970's due to the need of catalyst-equipped vehicles for unleaded gasoline and the EPA-mandated phasedown of lead in leaded gasoline, dropping from 211 billion grams of lead in 1970 to 78 billion grams in 1980 to less than one billion grams in 1989. Despite this enormous decrease in gasoline lead usage, total U.S. consumption of lead has actually increased since a 1980 level of approximately 1.1 million metric tons. Such increased lead usage is due in part at least to aggressive research and development of new uses by the lead industry. New uses of lead currently under development include: home radon barrier systems, lead-stabilized asphalt, computer chips, lead acid load leveling batteries, molten lead-based electrical energy generators, and earthquake shock absorbers.

Adverse Health Effects of Lead Exposure.—Lead enters the body through three routes: inhalation, ingestion, and absorption through the skin. Gastrointestinal absorption is influenced by a number of factors, primarily age and nutritional status.

Unlike elements like sodium, lead serves no useful biological purpose. Since the body can neither use nor metabolize lead, it is stored in blood, soft body tissues, bone and teeth. Lead accumulates in the body because the half-life of lead in bone is quite long and lead is generally excreted slowly from bones.

It is generally recognized that the effects of lead on children are more severe than on adults. A recent study by the Office of Tech-

nology Assessment (OTA) on neurotoxicity clearly describes the reasons for this result. Children ingest and inhale more lead per unit of body weight than adults and are thus more vulnerable to its effects. In particular, young children are likely to ingest paint, soil, and dust by putting these substances into their mouths. Children also have higher absorption rates for lead than adults (40 percent for infants compared to 5-15 percent for adults). Finally, children retain more absorbed lead than adults, due to storage of blood lead in growing bones (over 30 percent of absorbed lead is retained by infants, versus about 5 percent for adults).

The OTA report cites a number of other reasons why the effects of lead on children are more severe than on adults:

Children have less bone tissue in which lead is stored, leaving more lead in the blood that is free to exert toxic effects on various body organs.

Nutritional deficiencies, which are more likely in the growing child, can contribute to higher lead absorption levels.

Children's nervous systems (especially the blood-brain barrier) are not fully developed, and the same cellular lead exposure may produce disproportionate results compared to adults.

Cognitive effects occur at lower levels in children.

A landmark report to Congress by the Agency for Toxic Substances and Disease Registry (ATSDR) *The Nature and Extent of Lead Poisoning in Children in the United States: A Report to Congress*, July, 1988, provides a comprehensive summary of the adverse health effects of lead on children:

The primary target organ for lead toxicity is the brain or central nervous system (CNS), especially during early child development. Other key targets in children are the body heme forming system, which is critical to the production of heme and blood, and the vitamin D regulatory system, which involves the kidneys and plays an important role in calcium metabolism. Some of the major health effects of lead and the lowest-observed-effect levels (in terms of Pb-B [blood-lead] concentrations) at which they occur can be summarized as follows:

Very severe lead poisoning with CNS involvement commonly includes coma, convulsions, and profound, irreversible mental retardation and seizures, and even death. Poisoning of this severity occurs in some persons at Pb-B levels as low as 80 $\mu\text{g}/\text{dl}$ [micrograms of lead per deciliter of whole blood]. Less severe but still serious effects, such as peripheral neuropathy and frank anemia, may start at Pb-B levels between 40 and 80 $\mu\text{g}/\text{dl}$.

Numerous epidemiologic studies of children have related lower levels of lead exposure to a constellation of impairments in CNS function, including delayed cognitive development, reduced IQ scores, and impaired hearing. For example, peripheral nerve dysfunction (reduced nerve conduction velocities) have been found at Pb-B levels below 40 $\mu\text{g}/\text{dl}$ in children. In addition, deficits in IQ scores have been established at Pb-B

levels below 25 $\mu\text{g}/\text{dl}$. Preliminary data suggest that effects on one test of children's intelligence may be associated with childhood Pb-B levels below 10 $\mu\text{g}/\text{dl}$.

Adverse impacts on the heme biosynthesis pathway and on vitamin D and calcium metabolism, all of which have far-reaching physiological effects, have been documented at Pb-B levels of 15 to 20 $\mu\text{g}/\text{dl}$ in children. At levels around 40 $\mu\text{g}/\text{dl}$, the effects on heme synthesis increase in number and severity (e.g., reduced hemoglobin formation).

Of particular concern are consistent findings from several recent longitudinal epidemiologic studies cover a period of years showing low-level lead effects on fetal and child development, including neurobehavioral and growth deficits. These effects are associated with prenatal exposure levels of 10 to 15 $\mu\text{g}/\text{dl}$.

The most notable of the studies on neurobehavioral and IQ deficits are those conducted by Dr. Herbert Needleman and his associates. In 1979 Dr. Needleman found that young children exposed to lead had intellectual, attentional and behavioral deficits. The study showed a 5-point difference in mean IQ between the low-lead and the high-lead groups, with children in the latter group three times as likely to have an IQ below 80. None of the high-lead children had IQ's higher than 125, compared to 5 percent of the low-lead group. In 1990 (subsequent to the ATSDR report) Dr. Needleman published a followup study concerning the children evaluated in the 1979 study, finding that the effects of early lead exposure continued into adolescence. When reexamined as high school students, those children who had high lead levels in first grade evidenced poorer classroom performance, reduced vocabulary and reasoning scores, and higher absentee rates in school.

Fetuses may be even more vulnerable to lead toxicity than children. In addition to the above-described reasons concerning the vulnerability of children to lead poisoning, lead in women's bones may be mobilized during pregnancy and lactation (particularly to alleviate a calcium deficiency) and thus expose fetuses and infants through the placenta and breast milk.

Adults are also at risk from lead exposure. In addition to many of the adverse effects noted for children, research indicates that low levels of lead can exert toxic effects on adults. In 1985 EPA classified lead as a probable human carcinogen, based on animal study data (a finding recently endorsed by the Agency's Science Advisory Board). Lead may also impact the human reproductive system, based on laboratory animal experiments. Such experiments have reportedly shown failure of ovulation, delayed sexual maturity, impotence, sterility, and spontaneous abortions. In addition, statistical analyses have shown a relationship between low-level lead exposure and elevated blood pressure in adult males. Although the increase in blood pressure values is relatively small, it is of concern from a public health standpoint because of the relationship between blood pressure and cardiovascular disease, including strokes and myocardial infarctions.

Senior adults may be at particular risk, as lead stored in older persons' bones may be mobilized during osteoporosis or in the normal demineralization of the skeleton with aging. As one witness before the Toxic Substances Subcommittee stated, "we may indeed have senior citizen populations who are going to receive their lifetime exposure of lead coming back to them a second time." Such a release of lead in older people may be a cause of reduced mental function.

Levels of Exposure.—The most common means of determining the level of exposure of an individual to lead is to measure the amount of lead in his blood. Such blood-lead measurements are valuable in determining recent exposures to lead, but they do not provide an accurate assessment of lifetime exposure. For this purpose, measurement of lead in bone or teeth is more accurate because of the much longer half-life of lead in these substances. For children, collection and examination of "baby teeth" is the easiest way to make this determination. Other methods of directly measuring the amount of lead in bone are still under development.

Before the 1960's a blood lead level below 60 $\mu\text{g}/\text{dl}$ was not considered dangerous enough to require medical treatment. In 1970 the U.S. Surgeon General officially defined this level as one of "undue lead absorption." In 1975 this threshold level was reduced by the Centers for Disease Control (CDC) to 30 $\mu\text{g}/\text{dl}$, and in 1985 the threshold level for both lead absorption and lead toxicity was lowered to 25 $\mu\text{g}/\text{dl}$. In 1989 CDC convened an advisory panel to update its lead poisoning guidance. It is anticipated that, based on research findings since 1985, the threshold level will be reduced once again (e.g., to 10 or 15 $\mu\text{g}/\text{dl}$).

Other organizations have also examined the issue of the level at which lead exposure is hazardous. In 1986 the World Health Organization stated that 20 $\mu\text{g}/\text{dl}$ is the maximum acceptable blood lead level. EPA's Clean Air Scientific Advisory Committee associated blood lead levels of 10 to 15 $\mu\text{g}/\text{dl}$ (and possibly lower levels) with adverse health effects, and recommended this range as the maximum allowable levels. A December 1989 statement by the Agency's Science Advisory Board stated that "... there is likely to be no threshold for lead neurotoxicity, at least within the contemporary range of blood lead levels (i.e., 1-10 $\mu\text{g}/\text{dl}$)."

In 1988 the Agency for Toxic Substances and Disease Registry, in response to a congressional directive, issued a comprehensive report that estimates the number of children (six months to five years old) at risk from lead exposure. Using a blood-lead level of 15 $\mu\text{g}/\text{dl}$ as the maximum acceptable level, ATSDR estimated that approximately 2.4 million white and black children in U.S. standard metropolitan statistical areas (SMSA's), or about 17 percent of such children, are at risk of adverse health effects from lead exposure. If other racial categories and children outside SMSA's are included, between three and four million children in this age range may be at risk from lead. Using a cutoff level of 25 $\mu\text{g}/\text{dl}$, about 200,000 children are at risk. Many groups of children (e.g., black, inner-city, or lower income) have much higher percentages of children whose blood-lead levels exceed these threshold levels.

ATSDR also estimated the number of fetuses at risk from lead exposure. During any given year the Agency estimated that ap-

proximately 400,000 fetuses are at risk of adverse health effects due to exposure to maternal blood-lead levels of greater than 10 $\mu\text{g}/\text{dl}$.

The ATSDR report did not attempt to estimate the number of children at risk in particular urban areas. A report issued by the Environmental Defense Fund (EDF) in 1990 did include such estimates, based on an analysis that looked at the age of housing stock and the presence of lead paint in housing, as well as factors such as family income, age of children, race, and place of residence. EDF's estimates showed substantial differences in exposures of children in different racial, economic and residential location groups. For example, young black children living below the poverty level (\$6,000) in the central cities of large metropolitan areas (SMSA or 1 million population or more) may have a greater than 95 percent chance of having a blood lead level that exceeds 10 $\mu\text{g}/\text{dl}$, and about a 67 percent chance of exceeding 15 $\mu\text{g}/\text{dl}$. But the report also shows that other children have a substantial chance of being at risk. For example, white children in the highest family income category (greater than \$15,000), according to the EDF report, who do not live in the central cities of large urban areas have greater than a one-third chance of having blood lead in excess of 10 $\mu\text{g}/\text{dl}$.

Lead exposures also vary from area to area, with higher exposures estimated for areas with older housing stock like the Northeast and Midwest. For example, almost 75 percent of the children in the New York City SMSA are estimated to exceed a blood lead level of 10 $\mu\text{g}/\text{dl}$, and over 33 percent a level of 15 $\mu\text{g}/\text{dl}$. But areas with newer housing stock are not exempt from this problem. For example, in the Las Vegas SMSA (a rapidly growing area with a large amount of relatively new housing) almost 12,000 children (over 28 percent of the area's children) are estimated by EDF to exceed a blood lead level of 10 $\mu\text{g}/\text{dl}$.

There are no comparable estimates of the total number of adults who are at risk from lead exposure. For adults, occupational exposure is a major source of lead. The National Institute for Occupational Safety and Health (NIOSH) lists 113 occupations that may involve lead exposure. A 1987 study of occupational exposure found over 1,000 workers in three States with blood lead levels in excess of 40 $\mu\text{g}/\text{dl}$, with 200 at levels above 50 $\mu\text{g}/\text{dl}$. The California Department of Health Services has reported receiving over 3,000 reports of adult blood lead levels in excess of 25 $\mu\text{g}/\text{dl}$ (concerning almost 1,300 individual adults) during a nine-month period of 1987. About one percent of all reports showed blood-lead levels in excess of 80 $\mu\text{g}/\text{dl}$, 7 percent in excess of 50 $\mu\text{g}/\text{dl}$, and 21 percent in excess of 40 $\mu\text{g}/\text{dl}$. Workers in lead smelting, battery manufacturing, and brass foundries accounted for nearly 80 percent of the reports (construction, radiator repair, pottery and ceramics manufacturing, and gun firing ranges accounted for the remainder).

Another group at risk from lead exposure is pets. Often the lead poisoning of a dog or cat is the first sign that a dwelling has a lead problem. This phenomenon was evidenced dramatically in August 1990 when President Bush's dog Millie, was reported to be ill from lead poisoning caused by ingesting lead-based paint removed during renovation of the White House. Thus household pets may

involuntarily serve the same function with respect to lead poisonings as canaries that were placed in mines to warn of toxic gases.

Federal Legislative and Regulatory Actions.—Congress has specifically addressed the lead problem in paint and drinking water. Federal legislation has also provided the basis for regulatory controls aimed at reducing lead in gasoline, ambient air, solid waste, occupational exposure, and food. To date there has been no Federal legislation that attempted to deal with the full gamut of the lead problem. This section summarizes major Federal legislative and regulatory activities to control usage of lead. In addition, state and local legislation has addressed lead problems, particularly those related to lead-based paint.

(1) *Paint.*—In 1971 Congress enacted the Lead-Based Paint Poisoning Prevention Act. This Act and its subsequent amendments has three major components. First, it directs the Consumer Product Safety Commission (CPSC) to establish a safe level of lead in paint. CPSC in 1977 issued regulations to prohibit the manufacture of consumer paint containing more than 0.06 percent lead. Toys and consumer furniture articles are also covered by the CPSC regulations. Certain types of paint are exempt from the lead restrictions, including artists' paint are exempt from the lead restrictions, including artists' paint and industrial, traffic, and graphic art coatings.

The second major component of the Act allocated various responsibilities to the Department of Housing and Urban Development (HUD) concerning lead-based paint in housing. HUD was required to: develop and carry out a demonstration and research program to determine the nature and extent of the lead-based poisoning problem in the U.S., including the most effective abatement methods; establish procedures to eliminate "as far as practicable" the hazards of lead-based paint in existing housing covered by mortgage insurance or housing assistance programs of the Department; establishing procedures to eliminate lead paint hazards in all federally-owned residential property prior to sale; and prohibit the use of lead-based paint in federally-constructed or rehabilitated structures.

HUD's implementation of these provisions has been criticized by the General Accounting Office and others, and a 1982 Federal court decision rejected the Department's narrow interpretation of a key statutory provision *Ashton v. Pierce*, [541 F. Supp. 633 (D.D.C. 1982), *affirmed*, 716 F.2d 56, *modified*, 723 F.2d 70 (D.C.Cir. 1983).] HUD subsequently revised its implementing regulations in 1986 and 1987. In 1988 Congress made major amendments to the Act, requiring the Department to address paint hazards on all surfaces, to conduct testing and abatement programs in certain public housing properties, to conduct a demonstration program on the cost-effectiveness and applicability of various lead paint abatement methods, and to submit two reports to Congress that include "comprehensive and workable" plans to abate lead in public housing and private housing.

The third major part of the Act established a grant program to fund state lead prevention programs for children, administered by the Centers for Disease Control from 1973 until 1981 when it and other health grant programs were merged into a block grant pro-

gram. The Lead Contamination and Control Act of 1988 provided new authority to CDC to provide lead poisoning prevention grants to states, with \$24 million authorized for fiscal year 1991.

(2) *Gasoline*.—Section 211 of the Clean Air Act authorizes EPA to regulate fuels and fuel additives as needed to protect the public health or motor vehicle pollution control equipment. In unleaded gasoline for vehicles equipped with catalytic converters and to require a phasedown of the use of lead in leaded gasoline. Under the initial set of lead phasedown regulations (and revisions thereto), a final standard of 0.50 grams of lead per total gallon took effect in 1980 (with less stringent standards for small refineries). In 1982 EPA promulgated a standard of 1.10 grams of lead per leaded gallon (a slight reduction in allowable lead content) and eliminated special standards for small refineries. In 1985 EPA promulgated much more stringent standards for lead in leaded gasoline, with a standard of 0.10 grams of lead per leaded gallon effective in January 1986. The 1985 rulemaking notice also proposed a total ban on lead in gasoline, but this has never been finalized. The combination of the increased use of unleaded gasoline and the reduction in the allowable lead content of leaded gasoline has resulted in a reduction of over 99.5 percent in the use of lead in gasoline since 1970.

(3) *Ambient Air*.—Section 109 of the Clean Air Act requires EPA to promulgate national ambient air quality standards (NAAQS) to protect the public health and welfare. In 1978 the Agency promulgated a primary NAAQS for lead which provided that lead in the ambient air may not exceed 1.5 micrograms per cubic meter ($\mu\text{g}/\text{m}^3$). This standard was designed to prevent children from being exposed to lead concentrations that could result in blood lead levels in excess of 30 $\mu\text{g}/\text{dl}$. States whose air quality exceeds the ambient standard are required to develop implementation plans to reduce lead emissions. EPA is currently considering revision of the lead ambient air quality standard.

(4) *Drinking Water*.—The Safe Drinking Water Act requires EPA to publish maximum contaminant level (MCL) goals and to promulgate national primary drinking water regulations for pollutants that may have an adverse effect on the public health. Under this authority the Agency in 1975 promulgated a regulatory standard of 50 micrograms of lead per liter of water ($\mu\text{g}/\text{L}$). In 1986 Amendments to the Act, Congress listed 83 contaminants (including lead) for which EPA was required to develop MCL goals and promulgate drinking water regulations. In response to this directive, the Agency in 1988 proposed an MCL goal for lead of zero and a regulatory standard of 5 $\mu\text{g}/\text{L}$ to replace the existing 50 $\mu\text{g}/\text{L}$ standard. The proposed regulations also would require corrosion control treatment techniques if specified "action levels" of lead are not met, as well as a public education program if other measures fail. This proposal has not been finalized.

The 1986 Amendments to the Safe Drinking Water Act also banned the use of lead solder and flux (lead content greater than 0.2 percent) in public water systems and plumbing, as well as use of pipes and fittings containing more than 8.0 percent lead. These bans are to be enforced by the States through State or local plumbing codes, with withholding of Federal water grants as a sanction for non-enforcement.

In 1988 Congress addressed the problem of lead in drinking fountains in the Lead Contamination Control Act. This Act banned the manufacture and sale of drinking water fountains containing lead that comes into contact with drinking water supplies. EPA is required to publish lists of water coolers that contain lead and to provide guidance to schools in detecting lead in school drinking water.

(5) *Occupational Exposure*.—Under authority of the Occupational Safety and Health Act of 1970, the Occupational Safety and Health Administration in 1978 promulgated regulations to set a maximum allowable level of lead in air inhaled by workers. The regulations establish a maximum exposure level of 50 micrograms of lead per cubic meter of air ($\mu\text{g}/\text{m}^3$) and an action level of 30 $\mu\text{g}/\text{m}^3$ [at which environmental monitoring, recordkeeping, medical surveillance and other requirements apply to the employer].

(6) *Soil*.—There is no specific Federal program for removal or treatment of soil-based lead. Under authority of the 1986 Superfund legislation EPA is currently conducting a demonstration program in residential neighborhoods of three cities to determine whether abatement of soil lead will reduce childhood exposure to lead.

(7) *Solid Waste*.—Under authority of the Resource Conservation and Recovery Act (RCRA), a solid waste qualifies as hazardous if it leaches lead above a threshold of 5 parts per million (certain lead-containing wastes are also separately listed as hazardous wastes). Detailed requirements apply to the management and disposition of hazardous wastes.

(8) *Food*.—Under authority of the Federal Food, Drug and Cosmetic Act, the Food and Drug Administration (FDA) has established limits on the amount of lead in ceramic ware and in many color additives used in food, drugs and cosmetics. Lead limits in ceramic ware range from 2.5 $\mu\text{g}/\text{ml}$ for large pitchers and bowls to 7 $\mu\text{g}/\text{ml}$ for flatware. A limit of 0.1 $\mu\text{g}/\text{ml}$ for ceramic pitchers was proposed by FDA in 1989. For color additives, limits on allowable lead content are generally in the range of 10 to 20 parts per million (ppm), but lead limits as high as 70 ppm (color additive used in surgical sutures) and as high as 0.6 percent (lead compound intentionally added to a hair coloring cosmetic) have been established. The FDA has also been involved in voluntary industry efforts to reduce the use of lead solder in cans containing food and the use of lead in other food containers of concern (e.g., canned evaporative milk, infant juices, canned infant formula).

(9) *Toxic Substances*.—Section 6 of the Toxic Substances Control Act (TSCA) provides regulatory authority to EPA to regulate chemical substances and mixtures when their manufacture, processing, distribution, use or disposal presents or will present "an unreasonable risk of injury to health or the environment". Section 5 of TSCA provides for a pre-manufacture review by EPA of significant new uses of a chemical substance and authorizes EPA to regulate such new uses upon a finding of unreasonable risk. To date EPA has not used this regulatory authority to regulate lead-containing products, although the Agency reportedly has an investigation underway to determine whether such regulatory authority should be used for this purpose.

The Remaining Problem.—The ATSDR report to Congress on lead poisoning states that the lead problem in the United States can be expressed in a simple statement: "Lead is potentially toxic wherever it is found, and it is found everywhere." The report goes on to describe clearly why, despite congressional, regulatory and other efforts, lead remains a major public health problem. Factors listed in the ATSDR report are:

The Indestructibility of the Problem. As an element, inorganic lead cannot be processed by current technology and destroyed. It will continue to be a potential problem in some form forever.

The Relative Non-Transferability of the Problem. Lead cannot be easily shifted from a nonhazardous setting without some concomitant increased potential risk elsewhere. Once removed from its geologically bound forms by human activities, lead poses a toxic threat for which there are no natural defense mechanisms.

The Environmental Accumulation Factor. Lead accumulates indefinitely in the environment so long as input continues—no matter in how small a quantity.

The Human Body Accumulation Factor. The human body accumulates lead over the individual's active lifetime and does so even with "small" intakes from common sources. For hazardous to exist, major exposures at given points in time need not occur.

The Risk Population Accumulation Factor. Estimates of exposure and toxicity based on data from particular points in time . . . greatly understate the cumulative risk for a population posed by a uniquely persistent and pervasive pollutant such as lead. This cumulative toll over extended time is of much greater magnitude, and hence concern, than the prevalence or total exposure estimates for any given year. . . .

The Pervasiveness of the Problem. As a pervasive toxicant, lead is shown in this report to affect totals of children that are high in all socioeconomic/demographic strata. The U.S. lead problem is not simply a problem of a generally neglected segment of society. At present, little or no margin of safety exists between existing [blood-lead] levels in large segments of the U.S. population and those levels associated with toxicity risk.

Absence of a Truly Optimal Blood Lead Level. As a toxicant serving no known physiological requirement, the presence of lead at any level in the body is less than optimal. Current average [blood-lead] levels in some U.S. population segments are 15- to 30-fold higher [than] the theoretical value of 0.5 $\mu\text{g}/\text{dl}$ calculated for early, preindustrial humans.

Witnesses in hearings held by the Toxic Substances Subcommittee have described in clear and graphic terms the very serious nature of the lead public health problem. Dr. Herbert Needleman, the leading expert on childhood lead poisoning, made three major points in his testimony: "The first is that this is the most serious

pediatric problem in the United States today. The second is that it is totally preventable. The third is that in preventing it, we can accomplish enormous social good in other areas." Dr. Vernon Houk, Director of the U.S. Centers for Disease Control, called lead poisoning the "most common" and the "most societally devastating" environmental disease of young children. Dr. Houk stated, "I can't think of anything more devastating than a population of children with no superior intelligence and no geniuses . . ." Another witness stated that "what lead destroys is what Walt Disney once described as the most valuable natural resource of this country: the minds of our children." Yet another witness, the director of a local lead poisoning program, decried the lack of attention to what he termed the "invisible epidemic" of lead poisoning:

If the Baltimore City Health Department were to suddenly announce 30,000 cases of measles in the city of Baltimore, the public outcry would be enormous. However, the Health Department has publicly announced that there are 30,000 children in our city under the age of seven who have blood lead levels high enough to be causing permanent brain damage, and there has been hardly a whimper of interest.

A headline on a commentary in the Washington Post summed up the childhood lead poisoning situation succinctly: "A National Recipe for Stupidity".

A look at the sources of lead exposure also shows that there is a great deal of work left to be done to eliminate this "invisible epidemic":

Paint.—The ATSDR report to Congress estimated that almost 42 million homes, 52 percent of all residential housing units in the country, are painted with lead-based paint. This number includes almost all pre-1940 housing, 70 percent of the housing constructed between 1940 and 1959, and 20 percent of 1960-74 housing. ATSDR estimates that 12 to 13.6 million children live in housing with lead-based paint. Almost two million units, housing over one-half million children, are estimated to have peeling lead-based paint.

Although the manufacture of lead-based paint for consumer use has been banned since 1978 by CPSC regulations, these regulations have no effect on previously-applied lead-based paint. Nor do they apply to industrial, traffic and certain other types of paint. The presence of such paints in the marketplace can result in misuse, as occurred in Connecticut in 1984, where lead made for industrial use was found being sold as household paint to unsuspecting consumers.

HUD has been criticized for its performance in carrying out its lead paint abatement responsibilities under the Lead-Based Paint Poisoning Prevention Act. Other agencies with housing responsibilities may not be doing much better. In one case brought to the attention of the Committee, the Veterans Administration (VA) sold a house in New Hampshire to a couple with young children without conducting an inspection for lead paint hazards as required by HUD regulations. When the children showed signs of lead poisoning and the house was found to have paint containing up to 51 per-

cent lead, the VA refused to take corrective action and is in the process of foreclosing on the couple's mortgage.

Even where adequate regulations are in place, they provide no guarantee of compliance. For example, the CPSC recently announced the filing of law suits against seven major distributors and importers of toys containing paint with up to an 11 percent lead content.

Gasoline.—The spectacular success of EPA regulations in reducing the amount of lead in gasoline has resulted in significant reductions in lead in both the ambient air and blood lead. Nevertheless, a large amount of lead continues to be used in this product. In 1989 American motor vehicles consumed almost 10 billion gallons of leaded gasoline containing a total of 920 million grams of lead. ATSDR estimated that about 5.6 million children are potentially exposed to gasoline lead, and that in 1987 actual exposure may have affected 1.6 million children at blood-lead levels over 15 $\mu\text{g}/\text{dl}$.

In addition to usage in leaded gasoline, lead is used in aviation gasoline, racing fuel and certain consumer fuel additives. There are no Federal regulations restricting such usage.

Ambient Air.—The ambient air quality standard for lead has not been revised since 1978, despite a requirement in the Clean Air Act that such standards be reviewed and, if necessary, revised every five years. In a recent review of EPA's preliminary analyses for a revised ambient lead standard, the Agency's Clean Air Scientific Advisory Committee noted that levels approaching the current standard provide "relatively little, if any, margin of safety" and urged "greater consideration be given to air lead values below 1.0 $\mu\text{g}/\text{m}^3$." ATSDR estimated that 230,000 children are potentially exposed to stationary sources of lead (e.g., smelters), and that about 13,000 children are exposed to toxic levels of lead from primary and secondary smelters. The primary ambient lead standard of 1.5 $\mu\text{g}/\text{m}^3$ continues to be exceeded near certain nonferrous smelters and other point sources of lead, with a high 1988 quarterly average reading of 8.59 $\mu\text{g}/\text{m}^3$ near a primary lead smelter in Herculaneum, Missouri (near St. Louis).

Drinking Water.—EPA has not yet finalized its proposed maximum contaminant level goal of zero and regulatory drinking water standard of 5 $\mu\text{g}/\text{L}$. ATSDR estimated that 4.8 million children in older residences and 1.8 million children in newer residences are potentially exposed to lead from home plumbing systems, with actual exposure to drinking water lead levels greater than 20 $\mu\text{g}/\text{L}$ estimated for about 3.8 million children. EPA has estimated that 241,000 children have blood-lead levels above 15 $\mu\text{g}/\text{dl}$ because of elevated levels of lead in their drinking water.

Dust and Soil.—Lead has accumulated in dust and soil in substantial amounts as the result of paint decomposition and fallout from airborne lead generated by motor vehicle and stationary source emissions. ATSDR estimates that 5.9 to 11.7 million children are potentially exposed to lead in dust and soil.

EPA has determined that over 400 sites on the Superfund priority list, about one-third of all such sites, contain lead as a major contaminant. An article in the New York Times, October 2, 1990, described the contamination of a Superfund site in Idaho's Silver

Valley with "vast amounts of lead." The article reports that in 1973 alone 30 tons of lead per square mile were deposited on communities surrounding the Bunker Hill smelter, causing acute lead poisoning of nearly 200 children (many of whom required hospitalization). Although the smelter closed in 1981, recent tests reportedly showed that children are still being contaminated from lead in soil. Cleanup costs, estimated to run as high as \$200 million, include the cost of digging up the lawns of about 1800 homes to a depth of one foot and replacing the soil at an average cost of \$23,000 per home.

Food.—Lead in food can come from a number of sources, including lead solder in food cans, pesticides, water used to process the food, color additives, and lead glazes on dishes and ceramic ware. ATSDR has stated that most children under the age of six in the U.S. are potentially exposed to lead in food in some amount, with as many as one million children actually exposed to this source of lead in amounts sufficient to raise blood lead to levels of risk. Although voluntary industry efforts have significantly reduced the number of food cans containing lead solder from 90 percent in 1979 to less than 4 percent in 1989, a large number of cans still contain such solder. Imported ceramic ware also remain a particular concern because of higher violation rates of existing FDA regulations. In addition, many color additives used in food, drugs and cosmetics are permitted to contain lead.

Other.—In addition to these major sources of lead exposure, a vast number of other lead-containing products may present a risk of adverse health consequences in their manufacture, processing, distribution, use, and/or disposal.

Many years ago Benjamin Franklin wrote about lead poisoning: "How long a useful truth may be known and exist, before it is generally receiv'd and practis'd on." The Committee believes that it is past time to "practice on" the "useful truths" we in this country have painfully learned about lead poisoning. The actions mandated by this bill are a modest beginning toward this end.

SECTION-BY-SECTION DISCUSSION

Section 402. Lead Content Restrictions and Exemptions

A premise underlying the Lead Exposure Reduction Act is the need to minimize human exposure to lead. Recognizing that certain uses of lead cannot be substituted, every effort should be taken to promote recycling and prohibit disposal methods which result in dispersion of lead into the environment.

Section 2 of the Lead Exposure Reduction Act amends the Toxic Substances Control Act by adding a new title IV. Sec. 402 sets forth a series of restrictions on certain uses of lead. Those restrictions are based on "non-essential" uses of lead. Beginning one year after enactment, lead content in paint, plumbing fittings and fixtures, pesticides, toys and recreational game pieces, and curtain weights would be restricted. The Administrator of the Environmental Protection Agency (EPA) is authorized to either increase or decrease the percentages of allowable lead content in those products if an increase or decrease is found to be necessary to protect human health or the environment. Sales of restricted products containing

a greater percentage of lead would be permitted for up to two years after enactment to permit existing product stocks to be used up.

In addition to providing the Administrator the authority to adjust the allowable lead content percentages of restricted products, the Administrator is authorized to substitute a performance standard for lead leaching from plumbing fittings and fixtures for a 2 percent lead content restriction if he finds that such a standard is at least protective of public health and the environment. The Administrator is authorized to extend the one year deadline for the 2 percent restriction by an additional year, if a performance standard is going to be developed in lieu of that restriction. EPA has been working with the National Sanitation Foundation on a performance standard that may serve as a basis for an Agency promulgated standard. A representative of the Association of Metropolitan Water Agencies testified that plumbing fixtures can be a significant source of lead in drinking water. The AMWA testimony included the following statement:

Research conducted on the causes of lead in drinking water for the Des Moines area since 1987, by the Des Moines Water Works, verifies our concerns regarding the contaminant contribution of plumbing fixtures . . . research showed the primary source of contamination was often the plumbing fixtures themselves.

EPA is required to promulgate regulations within one year of enactment to waive the restriction of lead content of toys and recreational game pieces for certain collectibles and scale models. This exemption is designed to allow the continued production and sale of such items as lead toy soldiers, and scale model war game figures, collected and used by adults. A provision appears in section 404 that requires that exempt items be labeled to indicate that they contain lead and are not suitable for children.

In furtherance of the lead solder ban in plumbing, adopted during consideration of the 1986 Safe Drinking Water Act amendments, section 402(d) requires EPA to promulgate regulations banning the sale of lead solder to plumbers and plumbing supply wholesalers and retailers. Despite the fact that the lead solder ban in plumbing became effective over two years ago, there is evidence that it is still being used in violation of the law. This provision will curtail the availability of lead solder to plumbers, two years after enactment.

Section 402(e) establishes a two-track program for reducing the lead content in packaging materials. Beginning two years after the date of enactment, the lead content of packaging materials used for food items intended for human consumption is restricted. No lead may be intentionally added for any elements of food packaging after two years. The total lead content is phased out over a five year period. A waiver from the restrictions may be sought from the EPA Administrator for packaging materials manufactured prior to the enactment of the Lead Exposure Reduction Act, or for packaging materials which contain lead to comply with Federal, State, or local health and safety requirements. A certification of compliance with the restrictions is to be retained by the manufacturer and dis-

tributor and made available to purchasers of a package or packaging component.

The lead content of non-food packaging materials is similarly regulated over a longer period of time. No lead can be intentionally added to non-food packaging components beginning four years after the date of enactment. The total lead content is phased out over a seven year period. The waiver and certification procedures will also apply to non-food packaging components.

The lead content of food cans and wine foils is restricted beginning 18 months after enactment. The Secretary of Health and Human Services is authorized to allow the sale and use of wines produced prior to the expiration of the 18 months restriction deadline. Conforming changes are made to the Federal Food, Drug, and Cosmetic Act concerning the food can restrictions.

The lead content of gasoline is restricted in section 402(g). Six months after the date of enactment, it will be illegal to sell leaded gas for a price that is lower than the lowest price of unleaded gasoline. It will also be illegal to sell leaded gas in an urban area of 250,000 or more persons except for use for farm vehicles. Effective January 1, 1992, it will be illegal to sell leaded gasoline except for use in farm vehicles. That deadline may be extended for up to three years, based on a finding by the EPA Administrator in consultation with the Secretary of Agriculture that such an extension is warranted to assure that an adequate supply of leaded gas or lead additives is available for use in farm vehicles. This phaseout provision is identical to a provision adopted by the Senate during consideration of S. 1630, the Clean Air Act Amendments of 1989. In adopting these amendments, it is not intended that the Agency be prohibited from adopting de minimis lead levels to account for the incidental contamination of unleaded gasoline (as are currently found in EPA's fuels regulations). Any such levels should reflect only the likely levels and amounts of contamination, and should not be set too high.

Section 402(h) sets forth specific exemptions from the restrictions on uses of lead. Paint containing lead used by artists is explicitly exempt from the general ban on lead paint. Three general exemptions are included. Uses of lead for medical purposes, such as lead shields used for x-rays are exempt from restriction. A general national security exemption is provided for the Department of Defense, and for the nuclear industry. A special exemption is provided for use of lead in fire assay tests. This technique is used in the mining industry to detect the presence of gold and other precious metals.

A clarification is included to provide that recycling of metal, glass, plastic, paper, and textiles products is not considered "processing" for purposes of the restrictions in this section.

Section 403. Inventory of Lead-Containing Products

Twenty years ago, Congress recognized that little or no information existed to determine whether various chemicals presented hazards to human health and the environment. To address the deficiency, Congress required the Environmental Protection Agency under the Toxic Substances Control Act (TSCA) to compile an inventory of existing chemical substances. This inventory has provid-

ed a helpful mechanism for identifying chemical substances and determining which ones are likely to pose problems.

Testimony presented to the Toxic Substances, Environmental Oversight, Research and Development Subcommittee during two days of hearings, conducted on March 8, 1990 and June 27, 1990, document that over 1.2 million tons of lead are consumed in the United States each year. Nearly 80 percent of this amount is devoted to the manufacture of lead-acid batteries. The remaining 20 percent is used in a variety of applications, where comparable—and safer—substitutes may be available.

In a six page letter to Subcommittee Chairman Harry Reid, Jeffrey Zelms, Chairman of the Lead Industries Association, outlined "some of the major uses of lead" which include X-ray shielding for medical and occupational purposes, aviation soundproofing, electronic circuitry, and consumer appliances. Industry officials expressed surprise about the extent of lead's presence in our society and noted efforts to cooperate with the Environmental Protection Agency in a complete review of lead production, use and disposal under Section 6 of the Toxic Substances Control Act. Mr. Zelms stated the industry's support of the development of an inventory of lead uses.

Section 403 requires each person who manufactures, processes, or imports any product that contains more than 0.1 percent lead by dry weight to submit a written notice to EPA, specifying the type of product, the quantity, the amount of lead used or contained in the imported product, and any other information the Administrator deems important. The Administrator may define the terms "product" and "product category" by administrative order. The Committee believes this flexibility will allow the creation of a useful inventory without imposing burdensome requirements on industry and the agency.

The Administrator is directed to develop procedures to assure the periodic update of the inventory and where practicable, utilize existing product classification codes such as the harmonized export-import codes compiled by the Department of Commerce. No later than 30 months after enactment of the Lead Exposure Reduction Act, the Administrator will report to Congress a summary of inventory information and recommendations for minimizing the release of lead into the environment and preventing human exposure to lead. Lead-acid batteries are excluded from these provisions.

Provisions similar to those in TSCA and the Emergency Planning and Community Right-to-Know Act of 1986 are included which allow persons submitting written notification to claim the information as confidential.

Section 404. Product Labeling

There is no question that lead is a toxic substance, can be extremely damaging to infants and children, and is ubiquitous in the environment. The Food and Drug Administration submitted a statement, published in the Subcommittee hearing record of June 27, 1990, which states in part, "Most of the lead to which we are exposed stems from man-made activities. American industry, for example, contributes several hundred thousand tons of lead to the environment each year." Consumers have the right to be informed

that lead has been used in the manufacture of a product, should a risk from exposure exist.

Section 404 requires the Administrator of the Environmental Protection Agency and the Commissioner of the Food and Drug Administration to promulgate labeling requirements for products that may pose a risk of exposure to lead. The regulations will become effective not later than two years after enactment.

Toys and recreational game pieces containing lead and not prohibited from production (collectible items and scale models) must state that such items are not suitable for children.

Section 405. Recycling of Lead-Acid Batteries

At the present time there are no substitutes for automotive and other lead-acid batteries. However, batteries can and should be recycled. It has been estimated that as many as 80 percent of lead-acid batteries are recycled now. Disposal of the remaining 20 percent is of concern, since incineration may result in air emissions, or disposal in landfills may result in soil and groundwater contamination. Section 405 of the bill establishes a mandatory recycling program. Beginning twelve months after enactment incineration and landfill disposal of batteries is expressly prohibited. Used batteries must be delivered to battery retailers or wholesalers, lead smelters regulated by States or the EPA Administrator under the authorities of the Solid Waste Disposal Act or the Clean Air Act, recycling facilities regulated by States or subject to regulation by the Administrator under the Solid Waste Disposal act, or automotive dismantlers. Use of the phrase "subject to regulation" is intended to make it clear that this bill does not create new authorities nor diminish the authorities of the Administrator under other statutes. Further, the term "lead smelter" refers to both primary and secondary smelters.

In general, battery retailers, wholesalers, and manufacturers must return used batteries to facilities described above. Retailers are obligated to accept used batteries of the same type and in a quantity approximately equal to the number that are sold. Battery wholesalers are required to accept batteries from their retail battery customers. Wholesalers are required to remove used batteries from their retail customers no less than every 90 days, except that if there are five or fewer batteries within 180 days. Battery manufacturers are required to accept used batteries from their customers of the same type and approximate quantity as the new batteries they sell.

Several provisions for labeling and notification are included to assure that customers are aware of recycling requirements under law. Battery retailers are required to post a notice stating prohibitions on disposal of batteries, and specifying recycling requirements. Beginning two years after enactment, batteries must carry a permanent label stating that "Federal law requires recycling; Seller must accept return". Other labels such as one recently adopted by the industry may be used in addition to the mandated recycling label. State and local labeling laws must include labeling requirements, written notice requirements for retailers, and collection requirements.

A general provision is included to permit the continued export of lead-acid batteries for the purpose of recycling.

Section 406. Enforcement

The enforcement provisions of a statute are of great importance in assuring compliance with substantive provisions of the law. S. 2637 generally makes technical and conforming amendments to the existing enforcement provisions of the Toxic Substances Control Act (TSCA). The bill makes it unlawful for any person to violate the regulatory provisions of new title IV of TSCA (section 402 to 405) or any rule or order issued under such sections. Inspection authority concerning products subject to title IV controls is added to section 11 of TSCA, and violations of title IV provisions are made subject to the civil and criminal penalty provisions of section 16 of TSCA and the specific enforcement and seizure provisions of section 17 of TSCA. Under these provisions, violators are subject to civil penalties of up to \$25,000 per violation and, for knowing or willful violations, criminal penalties of up to \$25,000 per day of violation and/or imprisonment for up to one year. Courts are also given authority to restrain statutory violations and provide other injunctive relief.

Section 407. Lead Abatement and Measurement

The Committee heard extensive testimony on the failure of the Federal Government to devote adequate attention to the abatement and detection of "old" lead, lead dust, lead in paint in houses and on other structures, lead in soil, and lead in drinking water. While the Department of Housing and Urban Development has been working on the abatement of lead in housing for over 20 years, it has only recently issued guidelines for abatement in public housing and has not provided sufficient guidance on how to abate lead in all the other homes in America. Some states have acted to encourage or require abatement, but no comprehensive national abatement plan exists. Recently EPA and HUD have begun to work together on lead abatement processes and contractor training, but there is not yet a comprehensive program to review new and existing detection and abatement technologies and to expand efforts to monitor blood lead levels and detect lead in the areas where we live.

These provisions will improve our ability to detect lead in homes, in soil, and in humans and provide us with critical information on which abatement techniques and technologies are most effective and least expensive. Only when we have improved our ability to detect and abate lead, will we be able to launch the full-scale national attack on the old lead which is causing lead poisoning in children across the country.

(a) *Program to Promote Lead Exposure Abatement.*—Many witnesses testified about the failure of the various agencies of the Federal Government responsible for lead-related concerns to work together to address the hazards of lead. In the past, each agency has worked on those lead-related concerns which were within its discrete mandates and there has been little coordination among agencies to ensure that the Nation has an effective, workable, consistent lead exposure reduction policy. S. 2637 would require the Ad-

ministrator of EPA and the Secretaries of Housing and Urban Development, Commerce, Health and Human Services, and Labor to develop a comprehensive, government-wide program to monitor, detect, and abate lead exposure hazards.

(b) *Standards for Environmental Sampling Laboratories.*—By establishing standards and a certification program for those laboratories which analyze paint, soil, and dust for lead content, the government can ensure that we are adequately prepared to embark on a nation-wide lead detection program.

(c) *Standards for Blood Analysis Laboratories.*—A critical aspect of a lead exposure reduction program is an accurate assessment of the blood lead levels of people of all ages around the country. This information will enable us to best prioritize abatement efforts. In order to conduct accurate testing around the country, performance standards and a certification program for blood analysis laboratories is necessary. In addition, those laboratories which are certified or accredited pursuant to this statute will be required to report blood lead levels to the Centers for Disease Control on a regular basis. A national reporting system will provide actual numbers of lead-poisoned individuals rather than the estimates which have been relied on in the past.

(d) *Contractor Training and Certification.*—In order to ensure that abatement work is done properly and that the abatement process itself does not expose those doing the abatement or those in the surrounding area to unnecessary additional risks, abatement workers must be adequately trained. EPA has been the only government agency developing curricula for training lead-based paint abatement workers. However, since the Department of Labor has always had primary responsibility for worker protection programs, training programs for abatement workers should be developed by EPA, which has already begun to do so, in conjunction with the Department of Labor. The Department has not at this time developed training programs to protect workers, those doing abatement work and those working in industries which use lead, from dangerous lead exposure. Furthermore, the fact that the Department has not taken steps to reconsider the maximum blood-lead level acceptable in workers in light of recent information on the health risks posed by lead is of serious concern. It is not intended that individual home owners who perform incidental lead abatement in conjunction with home repairs be required to go through training and certification. Building owners are included, meaning that owners of public and commercial buildings and housing with multiple units must undergo awareness training to assure an understanding of adequate lead abatement techniques.

(e) *Detection Technologies.*—In order to more effectively test for lead and to enable home buyers and renters to determine whether a house has lead paint in it, we must develop more effective, easier to use, and more accurate methods for detecting lead in paint and dust. A national program for testing these new detection technologies is important to ensure that the technologies introduced on to the market are effective and accurate.

(f) *Evaluation of Abatement and In-place Management Techniques to Reduce Lead Dust Levels.*—As part of a comprehensive effort to abate lead levels in homes and buildings, it is necessary

for the government agencies involved to conduct a detailed review of the efficacy of abatement and in-place management techniques. In reviewing in-place management EPA and HUD shall focus on the amount of dust in the air if in-place management is conducted in comparison to the dust remaining in the air after various types of abatement. Evaluation is critical to ensure that proper abatement techniques are used and that the risks from abatement do not exceed the risks of leaving the paint in place.

(g) *Evaluation of Emerging Abatement Technologies.*—If abatement is going to be conducted on a large-scale basis, as is necessary to prevent the poisoning of any more children, then the government must evaluate and encourage the development of new products for abating lead paint and dust either by removal or encapsulation. It is hoped that the development of new abatement products and their evaluation by the government will help reduce the cost of abatement of individual homes as well as ensuring the safety of those doing the abatement and those whose homes are being abated.

(h) *Classification of Abatement Wastes.*—S. 2637 reflects a concern that, although lead abatement has been progressing in some States for a number of years now, EPA has failed to provide those doing abatement with any guidance as to the proper disposal of lead abatement debris. Waste is being generated both from the abatement of lead inside homes and the abatement of lead in the soil outside homes. In order to determine the cost and feasibility of conducting large-scale abatement projects it is necessary to determine procedures for handling the abatement debris. Concern's that this waste not pose a risk to human health through improper disposal; however, it is critical to the ability to conduct abatement projects at a reasonable cost to minimize the amount of abatement waste which must be characterized as hazardous solid waste.

(i) *Exposure Studies.*—Continuing research on the sources of lead exposure in children with elevated blood lead levels is important to ensure that we are doing everything possible to protect children from the devastating effects of lead poisoning. While we know that the majority of cases of lead poisoning are in children exposed to lead paint in homes, we do not know with any degree of accuracy the relative contribution to lead body burden of lead in drinking water, lead in food, lead-based paint and dust from the paint, lead in ambient air, lead in soil, and other sources of exposure. We know even less about the sources of lead exposure in construction workers. Reports exist of construction workers being exposed to lead when stripping paint off existing structures and when tearing down buildings in which lead was used, but a more careful evaluation of these occupational exposures is necessary.

(j) Millions of American children and adults are at risk from lead exposure, and it is crucial that they be educated about the scope and severity of this major public health problem. The bill requires EPA in conjunction with the Agency for Toxic Substances and Disease Registry (ATSDR) to sponsor public education and outreach activities to increase public awareness of: lead poisoning problems from household sources; potential sources of exposure in schools and day care centers; and the need for abatement and management actions. These public education and outreach activities should be

designed to provide information and guidance to health professionals, the general public, and other groups that the two agencies determine to be appropriate.

The work done by ATSDR is impressive in compiling the 1988 report to Congress on childhood lead poisoning and in preparing materials on lead poisoning for health professionals, such as the June 1990 "Case Study in Environmental Medicine: Lead Toxicity" prepared for primary care providers. ATSDR is expected to have primary responsibility for preparing educational materials required by this legislation and in disseminating this information to health care professionals and state/local health officials. EPA, with its network of regional offices and experience in providing guidance to schools on asbestos problems, should take the lead in distribution of educational materials prepared by ATSDR to the general public, schools and day care centers, and other targeted groups.

(k) *Lead in soil is one route of exposure for children.*—Lead can accumulate in residential areas where exterior lead paint has been used and where heavy traffic has contributed to a build-up of lead in the soil. Although EPA has been conducting a demonstration project on abating lead in soil, the Administrator has not issued guidelines as to when abatement of lead in soil should occur. S. 2637 requires the Administrator to issue guidelines on action levels which should provide the Administrator with the necessary flexibility to evaluate the differing circumstances under which lead in soil will need to be abated. These circumstances may include the location of the soil, the amount of lead, the type of soil, the condition of the soil, and access to the soil.

(l) *Coordinator for Lead Activities.*—Although EPA has a number of different offices working on lead-related issues, there is no individual or office in the Agency which is responsible for coordinating Agency actions, for ensuring that the actions are consistent and that as a whole they form the most effective lead exposure reduction policy. Given that lead-related responsibilities are widely dispersed throughout the Agency and the government, it is important that the Coordinator for Lead Activities be responsible not only for reviewing all decisions within the Agency but also for coordinating the Agency's work on lead with other governmental entities.

Section 408. National Centers for the Prevention of Lead Poisoning

Much of the needed research on lead poisoning is best conducted at institutions of higher education where the multidisciplinary skills necessary to combat lead poisoning can be brought together. Under S. 2637 one or more National Centers for the Prevention of Lead Poisoning will be established at higher education institutions to promote research and development of the reduction of exposure to lead. The Centers' activities will focus on the development of treatments for lead poisoning, technologies for the detection and abatement of lead, and public education on ways to reduce lead poisoning.

Section 4. Blood-Lead Level Monitoring

It is estimated that lead poisoning affects 3 to 4 million American children. Forty years ago, blood lead levels of 80 micrograms per deciliter ($\mu\text{g}/\text{dl}$) caused concern. Today studies have conclusive-

ly shown that blood lead levels of 10-15 $\mu\text{g}/\text{dl}$ can be harmful to young children who are still developing, causing decreased intelligence and developmental and behavioral problems. According to Dr. Vernon Houk, Assistant Surgeon General of the United States, "If there is a threshold below which there are no adverse effects of lead on the young, it is near zero." Dr. Houk also told the Subcommittee that "the majority of children whose intelligence and development are being affected by lead are never identified." Dr. Herbert Needleman recommends that children have a blood test for lead at their first birthday and every year thereafter until they are past six years of age.

The Centers for Disease Control (CDC) administered a categorical grant program from 1973 until 1981 to assist State and local health departments in funding childhood lead screening programs. In 1981, this categorical grant program was shifted into the Maternal and Child Health Services Block Grants, which resulted in limited reporting of blood lead levels.

Currently only limited data is available about State activities relating to lead poisoning prevention. While the harms of this widespread environmental disease are irreversible, lead poisoning is entirely preventable. In order to implement an effective lead reduction strategy, the Committee believes reporting of blood lead levels is necessary. Section 3 calls on the Centers for Disease Control to encourage State public health officials to report blood-lead measurements to the Director of CDC. Within 18 months, the Secretary of HHS is required to submit a status report to Congress on the project and evaluate the feasibility and desirability of a national requirement for mandatory pre-school blood-lead screening. CDC and EPA are also given 24 months to report to the Congress on the effectiveness of blood-lead reporting provisions under the accreditation and certification programs for blood analysis laboratories.

New laboratory techniques are becoming available to measure blood lead at lower levels. According to CDC, several hundred laboratories from 30 States participate in a proficiency testing program to evaluate how well they can measure lead levels. The Lead Exposure Reduction Act also calls on CDC to establish a blood-lead laboratory reference project to assist States and local governments to establish, maintain, improve, and assure the quality of laboratory measurements performed for childhood lead poisoning prevention.

Section 5. ATSDR Report

The Administrator of the Agency for Toxic substance and Disease Registry is required to update its 1988 report on childhood lead poisoning within 24 months of enactment, and at 24 month intervals thereafter, for a 10 year period. In the initial report, ATSDR is required to assess potential exposure of children to excessive levels of lead in schools and day care centers. The report is also to be expended to cover adult lead poisoning.

Section 6. Restrictions on Ceramic Ware and Conforming Amendments

Lead in ceramic ware is currently subject to action levels set forth in compliance policy guides issued by the Food and Drug Ad-

ministration (FDA). Current action levels for lead leaching from ceramic ware are 7 micrograms of lead per milliliter of leaching solution ($\mu\text{g}/\text{ml}$) for flatware, 5 $\mu\text{g}/\text{ml}$ for small holloware (e.g., coffee cups, small juice containers, cereal bowls), and 2.5 $\mu\text{g}/\text{ml}$ for large holloware (e.g., pitchers and bowls). These action levels provide guidance to FDA and industry on unacceptable levels of lead leaching into food or drink from ceramic ware. They provide guidance to the Agency on the bringing of enforcement actions under the Federal Food, Drug, and Cosmetic Act, but they do not have the force of law of substantive rules. Compliance is measured by a 24-hour leaching test using a solution of 4 percent acetic acid. The FDA has also developed a quick screening test for use at ports and manufacturing facilities. In June 1989 the FDA proposed a regulatory standard of 0.1 $\mu\text{g}/\text{ml}$ for ceramic pitchers.

The bill amends the Federal Food, Drug, and Cosmetic Act to require the Secretary of the Department of Health and Human Services (HHS) to promulgate regulations establishing ceramic ware lead standards and testing procedures as necessary to protect public health. Such standards must be promulgated within one year of enactment of the bill. The bill also amends the adulterated food section of the Act to provide that ceramic ware will be deemed to be adulterated food if it leaches lead in violation of the regulatory standards established by the Secretary. The adulteration of food and the introduction of adulterated food into commerce are violations of the Act that are subject to civil penalties and other enforcement authority.

By including these provision in the bill, the Committee intends that HHS review current lead action levels for ceramic ware to determine if they are adequate to protect the public health. If found to be adequate for this purpose, they should be promulgated as regulatory standards. If not adequate, revised lead limits should be promulgated. In reviewing current action levels the Department should be mindful of the extensive research on lead poisoning that has been done since the current lead limits were set in 1980, which shows lead toxicity at ever lower levels. The Department should also give serious consideration to promulgation of the 0.1 $\mu\text{g}/\text{ml}$ standard proposed for ceramic pitchers, and the adoption of similar standards for other ceramic ware.

This section also makes conforming amendments to the Federal Food, Drug and Cosmetic Act (concerning lead in food cans) and to the Fair Packaging and Labeling Act (to reference the Lead Exposure Reduction Act of 1990).

AUTHORIZATIONS

\$25,000,000 is authorized to carry out provisions of the Lead Exposure Reduction Act in fiscal year 1991; \$24,000,000 is authorized in each fiscal years 1992 and 1993; and \$22,000,000 is authorized for fiscal year 1994.

HEARINGS

The Subcommittee on Toxic Substances, Environmental Oversight, Research and Development conducted a hearing on the health effects of lead exposure on March 8, 1990. 17 witnesses rep-

representing Federal agencies, State and local health departments, industry and public interest groups testified. A hearing was held by the Subcommittee on June 27, 1990, on two measures, S. 2593, the Lead Ban Act of 1990 and S. 2637, the Lead Exposure Reduction Act. 23 witnesses testified on behalf of Federal agencies, public interest groups, and industry.

MARKUPS

The Subcommittee on Toxic Substances, Environmental Oversight, Research and Development adopted an amendment offered by Senator Reid in the nature of a substitute to S. 2637 on July 27, 1990. The amendment incorporated some provisions of S. 2593. The Subcommittee approved the measure as amended to the full committee on a voice vote.

The Environment and Public Works Committee considered S. 2637 on October 4, 1990. A package of amendments offered by Senator Reid was adopted by voice vote. The bill as amended was approved on a voice vote.

ROLLCALL VOTES

Section 7(b) of rule XXVI of the Standing rules of the Senate and the rules of the committee on Environment and Public Works require that any rollcall votes taken during consideration of this bill be announced in this report. No rollcall votes were taken during consideration of this bill.

REGULATORY IMPACT

Section 11(b) of rule XXVI of the Standing Rules of the Senate requires the committee to evaluate the regulatory impact of the reported bill. It is not anticipated that this bill will impose a significant new regulatory burden.

COST OF LEGISLATION

Section 403 of the Congressional Budget and Impoundment Control Act requires each report to contain a statement of the cost of the reported bill prepared by the Congressional Budget Office. That statement has been requested. However, it is the opinion of the Committee that in order to expedite the business of the Senate, it is necessary to file this report, without the statement.

ADDITIONAL VIEWS OF MR. SYMMS

HEALTH CONCERNS RELATING TO LEAD

There is little room to dispute the negative health impacts of high levels of human exposure to lead. Such exposure can cause peripheral nerve damage, severe weight loss, and in extreme cases, mental retardation and ultimate death. Even at lower doses, where impacts are subtle, lead affects fundamental enzymatic, energy transfer, and homeostatic mechanisms in the body.

There is also growing evidence that elevated levels of lead in the blood of children and fetuses can delay early neurological and physical development, result in cognitive and behavioral alterations, damage red blood metabolism and vitamin D synthesis, and impair kidney functions.

In all cases of such health concerns, the physiological response is not caused merely by the presence of lead in the surrounding environment, but by the volume and proximate pathway of the body's exposure to the lead.

LEAD VERSUS LEAD EXPOSURE

The proponents of this legislation have very worthy goals—the reduction and possible elimination of health risks to adults, children and infants. But the direction taken by this legislation is very questionable. The presence of lead on earth poses no health risk in and of itself, a fact which is fortunate since the technology for destroying the lead atom so as to form some other element is not now available. As noted earlier, the true risk to public health is found in exposure to lead in ways and quantities that produce undesirable physiological effects.

And yet, in its earliest form, the bill appeared to set as goal the elimination of lead from the periodic table—a complete ban on any source or use of lead merely because such a goal was desirable in and of itself, regardless of whether or not any “exposure to lead” could logically proceed from that source or use. This approach is not only unjustified as a means to address public health concerns, but would be extremely difficult to implement.

For one thing, lead exists naturally in the human environment in many different soil types, in various metal ores, and even in some organic materials. There is little that Congress, or the Environmental Protection Agency, or any other instrument or government can do to change that fact. Consequently the goal of eliminating all human handling of lead would be extremely difficult to achieve, at least on this planet.

By taking such an arbitrary and “broad-brush” approach to regulation, the bill confuses its goals, leaving one to wonder whether it is, in fact, more of an industrial policy bill than an environment health and safety measure.

As an example of this, look at the treatment of lead in packaging materials. It might be reasonable to address lead-containing packaging associated with food and food products where exposure is a theoretic possibility. Instead, the bill simply bans lead packaging across the board, even in cases where direct health threats are not even remotely possible. The concept of "avoiding lead exposure to humans" is unclear, making the regulation look like an attempt merely to eliminate lead for lead's sake.

NEEDED: A FOCUS ON REAL HEALTH CONCERNS

One of the Environmental Protection Agency's first criticisms of this bill was that it seemed to ignore the real health concerns relating to lead exposure. The Agency itself is in the midst of preparing a comprehensive review of "lead in the environment." Note three of the first four issues raised in the Agency's proposed rule-making:

Prevention of hazardous or unnecessary *new* uses of lead, which present unreasonable risk of injury to health or the environment.

Restriction or phasing out of *existing* uses of lead in specific products known to be associated with human exposure during application or use, which present an unreasonable risk of injury to health or the environment.

Banning of *unnecessary* uses of lead, which present an unreasonable risk of injury to health or the environment.

In all three cases, the Agency accurately focused on uses, both new and existing, which present "unreasonable risk of injury to health and the environment." The reported bill does not adequately provide similar focus, appearing to ignore its public health objectives, and relying instead on essentially "arbitrary" standards to achieve its goals.

LEAD ALLOYS IN PLUMBING FIXTURES

One example of such arbitrariness is found in section 402(a). During consideration of this legislation, there was substantial concern expressed about the 2 percent prescriptive limit contained in this section regarding plumbing fittings and fixtures. These concerns were raised by numerous industries which recycle copper alloy products, including the plumbing industry. Specifically, there is considerable concern the 2 percent limit could actually result in increased leaching of lead, reduced recycling, substantial adverse economic impact upon foundries and homebuilders, and an inability to obtain an adequate supply of conforming products for the numerous components of faucets, water meters, valves and other products in the water distribution system.

The Committee's response to these concerns was to provide EPA with authority (but no explicit directive) to adopt a health effects performance based standard in lieu of the prescriptive percentage limitation. In so doing, it was recognized that EPA should continue to participate with other Federal and State health personnel and industry representatives, in completing work on National Sanitation Foundation Standard 61 for indirect additives to drinking water. The Committee has provided the Administrator with an ad-

ditional twelve months, if necessary, in which to adopt this performance standard in lieu of the prescriptive limitation.

While this is a positive step toward addressing the concerns of the copper alloy products and plumbing industries, the legislation, as currently drafted, remains seriously flawed and should be amended by simply deleting section 402(a)(2).

To begin with, the committee has no evidence to indicate that mandating this prescriptive percentage limitation will achieve any overall health-oriented objective. At best, existing data on the leaching of lead or other contaminants in drinking water supplies from copper alloy plumbing products containing lead is extremely inconclusive and casts doubt on the correlation between lowered lead content and leachate levels. A 2 percent alloy may well leach more than an 8 percent alloy, which in 1988 Congress defined as essentially lead-free (Lead Contamination Control Act of 1988, 42 USC sec. 300j-21(2)(D). This issue requires careful study before any such legislation is enacted.

A second reason that this prescriptive percentage limitation should be deleted from the bill centers on the economic chaos that such a limitation would likely trigger. For example, use of an alloy with only 2 percent lead would require major changes from current casting processes, and would require complete retooling in foundries throughout the United States. Productivity in machining operations would be dramatically and substantially reduced.

The prescriptive percentage limitation presents additional problems. Discarded scrap metals are now recycled to make plumbing products. Much of the volume of radiators and other secondary metals, which are now recycled to make plumbing fittings, would no longer be recycled and would add to the Nation's already overburdened landfill operations.

In addition, alloys using 2 percent lead may be more prone to leakage, resulting in expensive repairs to piping behind walls and (in the case of water meters for municipal water systems) deep underground.

Furthermore, plumbing product costs would escalate substantially and imported plumbing fittings would flood the domestic market, particularly given U.S. Customs' difficulties in determining compliance. Cost increases would occur because the alloy would be much more expensive than current alloys, the chips and turnings from its manufacture may not recycle as well, substantial machining adjustments would be necessary, and the alloy is much more difficult to cast.

And lastly, it should be emphasized that the Administrator and the National Sanitation Foundation have almost completed work on a health effects, performance based standard for lead and other contaminants. NSF Standard 61 will limit the amount of lead and other contaminants in drinking water. NSF 61 will do so based on established health effects criteria. Every product in a plumbing system which comes in contact with drinking water will be measured against this criteria, with the result that the standard will comprehensively limit exposure to lead and all other contaminants in drinking water.

Given the myriad problems triggered by the 2 percent prescriptive limitation in Section 402(a)(2), lacking an evidentiary basis for

imposing such a limit, and given the continuing work of the Administrator on this issue through the National Sanitation Foundation, there is no sound policy justification to support the provision. The bill would be greatly improved by its deletion.

COMMAND-AND-CONTROL VERSUS THE MARKET

In part, the flaws of the plumbing fixtures section are inherent in any regulatory bill that relies so heavily on pure governmental command and control. The proponents of the 2 percent requirement feel that some type of "fall-back" provision must be written into the bill to ensure that lead plumbing fixtures are addressed; but, lacking the kind of technical knowledge, experience and metallurgical skill of an organization like the National Sanitation Foundation, it is impossible for Congress to command compliance with standards that will, in every case, produce the best results for public health and safety. So the sponsors were left with nothing but a very crude standard (2% of content by weight) to achieve their end.

Command and control strategies are inherently flawed for other reasons as well, one the main being that its mechanism is mostly political. The process which preceded final reporting of this bill provides substantial evidence of this.

In its original form, the bill addressed a much more comprehensive list of lead uses. The process of narrowing the list to its final reported form was anything but scientific. For the most part, any use that could muster substantial political opposition got relief—whether stained-glass window manufacturers or fishing-lure makers. Less powerful political lobbies, such as the lead curtain weight makers, were left on the list. Now, one might question whether any of these uses poses significant threats to human health, but it would be difficult to find someone who honestly believed that curtain weights are much more hazardous than fishing lures. The only reason for singling them out was that they lacked political clout. Purely political decisions of this type usually do little for public health or safety.

If the goal is to discharge lead use because of the difficulty of handling the eventual contamination of the waste stream and the leachate from landfills, more market-based solutions can be developed. Assigning the cost of disposal to a product further up the production line is an excellent way of encouraging individuals and companies to choose safer and more environmentally sound product components. For example, a tax reflecting landfill lead handling costs could be imposed on lead feedstocks, causing manufacturers to make the voluntary choice of whether lead is sufficiently important to their industry to warrant paying the increased cost. Such a tax, however, must be imposed by the appropriate level of government and at such a rate as to reflect the true disposal costs of lead. A punitive tax becomes nothing but another method of command and control—with an economic rather than criminal penalty. Hopefully there will be opportunities to more fully explore this alternative in the future.

STEVE SYMMS.

CHANGES IN EXISTING LAW

In the opinion of the Committee, it is necessary to dispense with the requirement of section 12 of rule XXVI of the Standing Rules of the Senate in order to expedite the business of the Senate.

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